

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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Original Correspondence.

BRITISH MINING AND METALLURGY.

metals, and especially for copper, are firmly maintained in the Paris market. Chilian has advanced 4s. per ton, and has made 94s.; ditto in ingots, 98s.; tough English, and other minerals (pure standard), 92s. per ton. The German copper markets continues good. At Cologne there are rather numerous transactions; at Berlin the description has been satisfactory, but speculators have an attitude of considerable reserve. The Dutch tin has received many orders from England; the result has been advanced to 87½ fl., while Billiton, which is 84s., has realised 87½ fl. to 88 fl. The flow of English tin into Holland, which has been noted of late, is enormous. Stocks of Billiton in Holland are at present rather large. Stocks of Banca are enormous, but it must be remembered that they are not all available. The Society of Commerce, of February 98, 114 ingots, and there were *en route* the same date 55,650 ingots: making a total of 153,774 must be added 15,000 ingots, representing the unpreceding sales. The Society of Commerce has revised its method of selling its tin; instead of having two annually, it will hold bi-monthly sales, which will naturally increase its importance. The Paris tin market has been firm, at Havre or Paris, has made 158s.; Straits, 154s.; delivered at Havre or Rouen, 153s. per ton. The German tin has been rather quiet. At Paris rough lead is 4s., and pipes at 28s. per ton. In Germany lead is 4s., and prices are firmly maintained. Rolled zinc in Paris at about 34s. per ton. The German tin remained very well supported. German merchants and industrials do not anticipate any rise of coal, they begin to lay in supplies for the approach. They exhibit, however, considerable hesitation, as they can, the exorbitant pretensions of the coal-trade accept contracts on conditions which two years ago excited a storm of complaints. New engagements have been entered into by colliery proprietors on very limited scale, the conditions as possible for the purchaser. Some dealers have been quoted at 2s. per ton, and even a little less. The Loire Mines Company will pay, April 16, the dividend for 1872, or 7s. 3d. per share. The dividend per share is 12s. per share.

of the Ougrée Ironworks Company (Belgium) has expectations. When the rise in iron commenced, this not being well sold beforehand, was enabled to profit from the extraordinary revival which has taken place in the iron industry; hence contracts were concluded at unprecedented profits. The results obtained for the admitted of the distribution of a dividend of 2s. per share more than in the preceding year. The dividend for the first nine months of the exercise 1872-3 was of from 4s. to 6s. per share. Important redemptions have been effected, and the financial situation is consolidated. This state of affairs has been a material advance for the company, which were quoted at 24s. 12s. per share of 1871, and at 54s. 8s. per share at the close of December they have even further advanced.

in affairs begins to display itself in the Belgian iron attributable to the attitude assumed by the iron-trade. It will not concede the least reduction of rates, while, on purchases have coalesced so as not to do business with each other except in cases of extreme urgency. The consequences are reflected in the fact that few transactions have been concluded, and that rates have remained to a minimum, as has been shown by recent adjudications. The Government of Namur invited tenders for the ironwork of two bridges proposed to be thrown at Yvoir and Lustin. The lowest tender, which was the Selessin Works, amounted to 10,592s., while the that of MM. Perrin and Dopogne, of Jemeppe, was the other adjudication, at Malines, for the ironwork of a bridge to be erected near the station in that town, the quoted tender was 2480s., or 75s. below the official Belgian construction workshops are receiving commissions for which they stipulate, and which lead them very week in international competitions. The French Company, formerly known as Bonnefond and Co., has a large number of carriages and trucks of some importance on account.

coal trade exhibits little change. Some stocks of household coal to be formed, but coal for industrial purposes is in demand, without any material variation in prices. The movement appears possible at present, as any demand would inevitably involve the conclusion of imports with German collieries, to the detriment of Belgian coal received in Belgium from the valley of the Sambre, which is of considerable importance, and promise to be a market for Westphalian coalowners can resist the temptation of their prices under present circumstances. At the forge masters, at Charleroi, it was decided to obtain 2800 tons of coal for coke and forging purposes, as The coal thus obtained is to be delivered among various concerns, including delivery, did not exceed 11s. 4s. 5d. At the end, indeed, coal can be purchased at 17s. 8d. per ton. The purchase is announced of the Arsis in the Lower Sambre, by a new French company, in the style and title of Thezillat and Co. After some conferences, the bowtowners of the Sambre agreed to pay 8s. per ton as the rate of freight for Paris, and the French metallurgical interest applied with the present state of affairs, and to be with regard to the future. Under these circumstances, it is to be expected that there should be few changes to report in the

general aspect of affairs. Refining pig is worth 6s. 4s. to 6s. 8s. per ton in the Meurthe-et-Moselle group, while coke-made iron is quoted at 13s. 8s. to 13s. 12s. per ton, and charcoal-made ditto at 14s. 8s. to 14s. 16s. per ton. Plates maintain their price, and sheets display a slightly upward tendency. Old iron is worth about 8s. per ton, but it is neglected upon these terms. A French establishment—the Mulatière of Lyons—sent in recently the lowest tender for two bridges for the Belgian State lines.

DYNAMITE.

SIR.—With reference to the employment of the all but prohibited article, Dynamite, I received on the 23rd inst. the following report from my agent:—“Visited Sir Francis level and measured off six fathoms. The price per fathom was 5s., the time taken four weeks, six men working three at a time two shifts, six hours each, with McKean's Rock Drill. In driving the six fathoms they use $\frac{1}{2}$ cwt. of Dynamite. The men cannot form any idea of the amount of gunpowder it would have required to cut this ground, the beds are so strong and elastic, but the cost would have been very great. The men are all of one opinion, and would prefer paying 10 guineas a hundredweight for Dynamite than have powder given them for nothing. They also say that it would have cost about 7s. for gun-cotton had they used that explosive. They can drive one-third more ground with Dynamite than they can with powder in the same time.” Further on he says:—“At Swinneygill, with C. Raw and Co., driving the north cross-cut in bottom part of main line very hard. This is being driven by hand in the ordinary way. Four men, price 8s. per fathom. Measured them off 2 fathoms and 3 ft.—four weeks' work. They have used $\frac{1}{2}$ cwt. of Dynamite in cutting 2 fathoms and 3 feet; they say that it would have taken them six weeks to do the same amount of work had they only had powder, of which they would have used 4 cwt. They also say they would rather pay for the Dynamite than have the powder given free of charge.” Observe, 1st, the difference in price between machine and hand labour; 2d, the amount of ground cut by the two methods; and 3d, the difference in the quantity of Dynamite per fathom of ground. Lastly, allow me to ask will the mining interest submit much longer to be deprived of the use of the safest and most powerful explosive agent at present known, in order to benefit the Stowmarket monopoly? I trow not. But surely, Sir, it is high time, metaphorically speaking, to explode a small torpedo in the vicinity of the Home Office. “Coming events cast their shadows before.” I prophecy—

1.—That the public will cry out, “Away with these people. We mean to keep our powder dry, not wet, so as to be ‘ready, aye ready.’”

2.—That those two “Arcadians” Professor Able and Major Mandy will be “hoisted with their own petard.”

3.—That the factory at Stowmarket will again blow up, and that at the next enquiry the real cause of the explosion will not be concealed from the British public.

4.—That Woolwich will cease from piratical habits of patenting other people's inventions.

5.—That Dynamite will reign supreme. Dynamite means force. What is behind the “force?” The indignant voice of the great mining interests of the kingdom. We must have a Special Committee of the House of Commons to enquire into this matter.

Junior United Service Club, March 31. GEO. WM. DENYS. Bart.

EXPLOSIONS IN COAL MINES.

SIR.—It is not possible to conceive of an explosion occurring without the materials, in the shape of an accumulation of gas, a vitiated current of air, or something of that sort. It is, of course, always attempted to be proved in cases of explosion that there has been no accumulation of gas. Oh dear, no! The occurrence has taken place without such a disagreeable state of things as accumulation of gas; for it is always held to be a sort of reflection on the management if an accumulation has taken place. For what reason it is so held we really do not know, for he must be a very clever man indeed who can always prevent these things. Those who are acquainted with large fiery collieries know full well that there are in most of them pretty extensive accumulations, and this cannot be prevented without some very sweeping measure being adopted; but those dangerous mixtures are generally kept pretty secure under lock and key. They do, however, sometimes escape out, and get on to main roads, and shot firing, always a dangerous practice in a fiery mine, has, without doubt, brought many to grief. If the results of the experiments of Mr. Galloway should prove that an explosion may occur by concussion when a lamp is placed in an explosive mixture at a distance from the point where the shot was fired this ought to go far to induce managers to abolish shot firing entirely in all fiery mines, if that is possible.

To built up a scientific theory on the result of a coroner's inquest, or the evidence given by any witness at such an enquiry, appears to us to be castle-building on a foundation much less substantial than even the air. We do not make any imputations on either the coroner, jury, or witnesses, but it is evident that most of the statements made there are simply *ex parte*; there is no cross-examination, and, of course, no means of getting at the real narrow facts of the case. For instance, here is a case where a shot is fired, and an explosion of a very serious kind occurs nearly at the same time, but the point where the explosion occurs is at a great distance from the point where the shot is fired, and it is clearly shown that there is no connection between the two occurrences. Well, at the point where the explosion occurred naked lights were used; and in order to account for the explosion, we must have an explosive atmosphere. We may call it an accumulation, or a vitiated current of air, or what we like, but surely we are bound by plain common sense to assume that the air was foul at that point. Yet an important witness says that “It was his impression that there had been no accumulation of gas there.” This really ought to be taken for just what it is worth, and no more. It is quite possible that a witness may try a district for gas, and find no place where the gas will fire the lamp, and yet the air there may be vitiated, and not far removed from the explosive point, and in that case a change for the worst may have taken place when shots are fired some time afterwards, and the flame from the shot (a blown-out shot, say) may ignite the gas.

If we suppose that the air is vitiated, and nearly at the firing point, the concussion caused by the shot may have some effect in collect-

ing the materials for an explosion, or may force the flame through the gauze of a lamp when the gas is already ignited inside of it; but in those cases all the important rules established for the guidance of colliery managers are broken before the explosion becomes possible. When the air is in a proper state for miners to work there can be no danger from shot firing; but if the air is at all vitiated or mixed, which will happen in the best work, sometimes, then shot firing ought to be as strictly prohibited as working with naked lights. That is the only safe course to pursue. M. E.

Newcastle-on-Tyne, April 1.

WIRE-ROPE TRAMWAYS.

SIR.—I observe with reference to the Eberhardt and Aurora Mines that some trouble has been caused by the breakage of the rope of the wire tramway, and that another effort to use it is to be made. I do not know whether the carrying rope is in this case fixed or movable; but I have observed that in both cases errors are sometimes permitted to exist which could readily be removed. Where one rope is used for both traction and carrying, a very general fault is that the rope is used in too long lengths, for, whatever may be the theory of the matter, there is no question that in practice one long rope breaks more frequently than two short ones. How this happens I cannot tell, but I know that in the case where a five-mile rope had given much trouble, the very same rope cut in two and worked from the middle (of course the engine had to be removed, though, as it was only a portable one, that gave but little trouble), it long continued to work well without accident, and may be working now for all I know.

When the carrying rope and tow rope are used the difficulty seems to arise from another cause—the sag of the carrying rope, which, although stronger than the tow rope, is really broken thereby. The cause appears to me to be that when the load has reached the bottom of the sag, the tow rope continuing to pull in the same direction as before, brings the load suddenly against the carrying rope, and causes a certain vibration and fatiguing of the rope, which being repeated each time a load passes ultimately breaks the carrying rope. The tow rope no doubt breaks as frequently, but as the evil is quickly repaired but little notice of it is taken. Now, to get rid of the sag is not very easy when long distances have to be traversed, but where it is convenient to introduce rigid portions on the line, the difficulty can be easily overcome. In this case the line between the first and second, sixth and seventh, eleventh and twelfth posts, and so on, should be formed of T-iron of sufficient strength, and these pairs of posts may, if necessary, be placed closer together. The carrying rope is then stretched in the usual manner, but passed on the under side of the T-iron, and the sag may afterwards be pulled out of the rope by introducing screw struts between the under side of the T-iron and the rope, so that the former shall form the upper and the latter the lower chord, as it were, of a triangular girder. The successive introduction of these struts as the rope elongates keeps the line always in good order, and makes it much more durable, since the wear and tear in carrying the same loads is much reduced. The introduction of these rigid lengths is of course more costly than using one tightening apparatus, but it appears to me impracticable to pull the sag out of a long rope from any one single point.

Camborne, April 2.

H. J. B.

MINES AND MINING.

SIR.—I have selected the above heading for a letter, which I hope you will favour me by inserting in your columns, for the purpose of drawing attention to the scope and spirit of various communications which have lately appeared in your valuable paper in connection with mining subjects. Of course you give opportunity, with your customary liberality, for the ventilation of all opinions connected with geology, mineralogy, and practical mining, and for the expression of opinion in whatever terms employed. It appears to me that notions are sometimes thus conveyed which require to be controverted, and that very often there is a vagueness and inaccuracy of language concerning “mines and mining,” calculated to mislead, or, at all events, which affords no information whatever.

I am especially desirous of bringing under your notice how strongly incumbent it is upon mining agents and captains of mines in Cornwall, Devon, and Wales to repudiate the distortions of their intelligent reports by the practice of interested persons cutting them a paragraph here and there, or a particular form of expression, to subserve their own purposes, even if those purposes be not selfish and unjust, which they certainly not unfrequently are.

It will, perhaps, be as fair a way as I can promote this discussion if I put a series of questions, suggestive of the various particulars, or some of them, in which such conduct justly forms subject for complaint:—

1.—Can any man but a practical miner give a safe and sure general opinion of a piece of metalliferous country, the condition of a mine, the character of the ore, and the probable prospects of the enterprise? It would be about as wise to expect the like as to ask a “tailor in Tooley-street” to pronounce a judgment upon the last new iron steamer built by Mr. Laird, at Birkenhead; or a gentleman about town, who never did anything or knew anything practical, and probably never will, to give a chemical analysis. Yet you know, Sir, and personally deplore it, that “articles” are written which, without much play upon words, may be described as “indefinite articles,” and prospectuses prepared by persons whose rashness in undertaking the like reminds one of the Irishman who, when asked if he could play the violin, replied he did not know, for he had never tried, but was willing to make the experiment—only that Paddy's frolic had a dash of fun and wit in it; but the performances of which I complain are too serious for trifling, as many an honest investor knows to his cost. It is time that an end were put in mining matters to non-professional and non-practical judgments, whether they issue from a newspaper office or a City mercantile chamber.

2.—I ask, can anyone but a practical miner give the value of an end, rise, or sink, and the price to be paid for working them? A real miner can form a judgment at once; or, if there be any difficulty in doing so, arising from peculiar circumstances, he knows how to take the proper measures to solve it. Literally a practical miner taps the rock, and at once perceives where he is.

3.—Can anyone but a practical miner give particulars of the cost of raising, dressing, and making marketable the ore to be brought up from a tin, copper, or lead mine? No one inexperienced in

5. 1873.]

able interior deposit, which takes fire from combustion, and its throw out goes to show that asbestos is connected with this will ooz out some day. I have for years offered to the founders of this theory to a known burning mountain if they can show me a defined metallic vein charged with lodes, I will give in; and if they cannot they are bound on that theory. I say the overflowing lava from a volcanic is only to be compared to the cinder thrown out from melting works. The heat when cooling may throw out but will not form lodes; even the pillars of basalt at the causeway are only crystalline rock, formed in its own escape, from the nature of the rock's own contents.

If I take the tree, or vegetation, the same law prevails. The pear, the plum, and nut, all of different taste and because their origin is composed of a trifling different, and all follow the law of form agreeable to its combined

36, Hyde-street, New Cross, March 25. N. ENNOR.

N. ENNOR'S LESSONS TO YOUNG AGENTS—

TREBURGETT, &c.

As a constant reader of your valuable Journal, I beg you to allow me of having a few lines inserted by way of remarks on Mr. N. Ennor's history of his life, in last week's Journal. I have been much

of late by reading his letters on Tin Dressing, Saving, &c. Mr. Ennor is a remarkable man, as most of your readers are aware, as he writes much

well, and he is a most wonderful man. However, I have known him well for the last 35 years, and have heard him say he went as agent at

any of the Cornish or Devonshire miners would be spoken to by a lad

age, if so, times are greatly altered to what they were 65 years ago. I

about 20 different mines he worked in, besides nearly all the mines

and West Devon, whose names are legion, and if he did not know

another he must have been a dull schoolboy. I do not think it much

in one's character or ability to have been under so many masters,

I think one has a better chance to learn. If he had been considered such

as he now asserts, what a pity some gentlemen had not taken him

and made him a little more up to the mark than when he first came

to the parish.

The very readily names most of the mines he worked in, and as some of

silver-lead we should suppose he would have known silver as well as

he was a large owner in dividend paying mine previous to his

tin, silver-lead, &c., to slate quarry management, but omits to men-

tion of the mine. No doubt some of your readers would like to learn the

name of the mine, and as I happen to know it is no harm to state it was the

mine, and he was at St. Teath, that is now so vigorously working under

the management of Capt. Wm. Hancock, and who raised and sold ore last month

and the greatest part of it worth near 30/- per ton. A very large

part of the same was sent to surface by the former workers or agent, and

was carried away to repair the roads in the neighbourhood. The largest

part of the same was sent to the landowner there, Mr. Bawden, to build and repair hedges,

which have been taken down for silver and rebuilt with worthless stones,

any man got a handsome living out of the burrows and hedges for years,

and now in the neighbourhood saved hundreds of pounds, and has bought

an acre in St. Teath. No doubt the adventurers got some dividends, but Mr.

He was a large holder as well as manager, certainly had a good share of it,

and I think he had a better chance to learn. If he had been considered such

as he now asserts, what a pity some gentlemen had not taken him

and made him a little more up to the mark than when he first came

to the parish.

Mr. Ennor, while at Delabole, made the quarry pay; but, then, what

about slate, as there is no slate quarries in the land of tin, and I do

not know one before? But it happened to be a good quarry, and Mr.

and the next proprietor, always came every Thursday to look after

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The Prize Essay—Practical Mining.

No. IV.

ARTESIAN WELL-BORING APPARATUS.

Machinery for the purpose of boring through rock strata to secure supplies of pure water where the geological formation is favourable have been long in use, and have been applied most successfully, not only for this purpose, but for the sinking of petroleum wells. In the use of boring tools and machinery a few years since, though the broken and mixed borings enabled a general idea to be formed of the ground passed through, nothing of a definite or satisfactory character could be obtained, either in reference to the thickness or quality of the rock strata perforated. By the introduction of their improved boring apparatus Messrs. Mather and Platt are enabled to bring up solid cores, and thus giving the boring somewhat of the character of regular sinking, the cores showing distinctly the lines of parting and the direction of the dip of the strata. With the improved apparatus now employed, and the accurate results determinable, there is every reason to expect that in exploratory operations for minerals they will be largely used—in the coal-bearing districts especially—with very great advantage. In borings of large size and great depth the machinery is driven by steam-power. The following instances, out of a great number given by Messrs. Mather and Platt, show the speed at which bore-holes of different diameters have been sunk:—

Diam. of Bore-hole.	Depth of Bore-hole.	Rate of Sinking per day.	Locality.
Top. 24 in.	Bottom. 18 in.	12 ft. 12 in.	Particulars.
24 in.	18 in.	473 ft. 6 ft. 7 in.	Chalk and flints Canterbury.
24	18	1184	1 ft. 11 in. Chalk & flints. First 300 ft. bored in 130 days.
18	18	1312	2 ft. 5 in. New Red Sandstone, Clay, White Sandstone, Red Marl Gypsum, Limestone, Red Sandstone, and Pure Salt Rock. First 600 ft. bored in 100 days.
			Middlesex.

We have not thought it advisable to quote the prices of different makers for sets of apparatus, since the number and nature of the tools in the sets vary so considerably that prices, if not accompanied by an enumeration and description of the tools, would have a tendency to mislead.

The following firms supply the fullest information on receipt of requirements:—Messrs. Mather and Platt, Manchester. This firm lends or sells sets of boring apparatus, and we give below an example of their charge for the loan of a set of apparatus for boring holes from 6 in. to 12 in. in diameter, any depth, with winding-engine and 600 ft. of hempen rope—7s. per week; and 2s. per foot extra, for a 6-in. hole; 3s. per foot extra for a 9-in. hole; and 4s. per foot extra for holes up to 12 in. in diameter. The working expenses of the set are comprehended in the following items: wages of foreman to have the charge of machinery, and superintend the boring operations; wages of smith and striker to sharpen tools; wages of labour to fire-up, &c. Consumption of coal about 10 cwt. per day; cost of oil, tallow, &c., about 12s. per week. These gentlemen state that they have bored with their patent earth-boring machines in the aggregate 25,000 ft. in depth, up to February 6, 1872, exclusive of borings in Barbadoes, America, India, Demerara, Address, Mather and Platt, Salford Ironworks, Manchester; Messrs. Gwynne and Co., Essex-street Works, Strand, London; Messrs. Owens and Co., Whitfriars-street, Fleet-street, London; Messrs. Tangye Brothers, Cornwall Works, Birmingham.

DRAWING OR WINDING.

In none of the operations of mining has greater perfection been attained, as a whole, than in the transmission of broken mineral from the place of excavation to the surface. Rapid and economical drawing is a matter of great importance, especially under circumstances where quantity alone can make mining remunerative, such as in the case of ores of but little value, and coals. Here large quantities must be transferred to surface with great rapidity and at little expense. This will be seen in our collieries where the apparatus is adapted to deliver through the galleries and by a single shaft several hundred tons of coal daily. In metalliferous mines, where the shafts often deviate from the perpendicular to coincide with the dip or direction of the lodes, winding is necessarily a much slower and costlier operation, though many instances may be cited where with perpendicular shafts the winding is very rapid. Drawing may be regarded as embracing all the operations necessary for removing mineral from the place where excavated to surface—first, transmission from the place where broken to shaft; second, transmission through the shaft to surface.

Underground conveyance in metalliferous mines cannot always be accomplished with the same celerity as in collieries, owing to the narrowness and irregular course of the levels.

APPLIANCES IN USE FOR CONVEYING MINERAL TO BOTTOM OF SHAFT.

Shovels.—These are among the most common tools in use in mines. Their form and size vary with the class of mining in which they are used. They are generally made of iron with points steelied, but steel only is used sometimes. The hilts are usually of good tough ash slightly curved, but vary in length and shape quite as much as the shovels, depending on the circumstances of their use. Prices, hammered iron, 30s. to 34s. per cwt.; hammered steel point about 54s.

Barrows.—These are used in metalliferous mines, and are well adapted to the small levels. Each barrow is generally made to carry from 1 to 1½ cwt. of stuff; they are made of deal, bound at the joints with hoop iron, and with wood wheels bound with an iron band, or occasionally entire iron wheels. They are made on the mines at a cost of from 6s. to 8s. complete.

Wagons.—These are used for the same purpose as barrows, and wherever the state and size of the levels will permit are always adopted in preference, being more expeditious and economical. They are usually made of boiler plate or stout sheet-iron, with wrought or cast iron wheels, and run on tramways. At Buzz's United Mines, Gwennap, an ingenious arrangement was devised by the late Capt. Richard Gray for delivering the stuff through the levels, and which consisted of a series of plats and shoots, each shoot being fitted with a break-staff. The stuff, after being shovelled into the first shoot was emptied into the wagons, and conveyed through the intermediate series of shoots and wagons to the skip, and thence to surface without the necessity of the further use of shovels.

To form an adequate idea of underground winding apparatus we must be acquainted with the modes adopted in well conducted collieries, where every available force is in use, horse-power, force of gravity, compressed air, steam, &c., and the mechanical appliances, the most perfect of their kind. Railway planes are constructed of great length on which the wagons or tubs are run in long trains at a time, consisting sometimes of over 50, and upwards of 1,500 to 2,000 wagons are daily delivered from the workings to the bottom of the shaft. These tubs or wagons are generally made of oak strengthened with iron, but in some localities entirely of iron. The forms and sizes vary in different districts, though they are invariably of the same size and shape in the same mine. They are each fitted on four iron wheels; the axles usually revolve with the wheels, and are sometimes made of steel. They carry from 6 cwt. to 1 ton, but the smaller sizes are more common, especially where the winding is rapid. Tubs or wagons can be supplied by all colliery engineers and manufacturers.

The details of colliery underground winding apparatus consist of the usual drums or cages attached directly to the engine, or by means of intermediate toothed gearing for the increasing of either the speed or power. These drums are generally made of wrought-iron, but sometimes cast-iron and wood are partially used; they are made to suit the special requirements depending on whether chain or flat or round rope, either of hemp or wire, is used.

Efficient brakes for checking speed.—Pulley-sheaves and rollers for conducting the chain or rope, and for changing its direction; these are usually made of cast-iron with wrought-iron axles, and are of all sizes and forms suitable for the kind of rope or chain used. Clip

and wedge pulleys are capable of great application in connection with wire-rope, under certain circumstances, as on double inclines, and for working endless ropes, and may be conveniently substituted in the place of drums. Rope and chain will be noticed in drawing through the shaft.

No prices of winding apparatus can be given by any firms without reference to detailed specification of requirements. Below we give approximate prices of some of the smaller parts:—Wheels under 2 cwt. 21s. per cwt.; pulleys, 18s. per cwt.; wheels, 1 cwt. to 3 cwt., 19s. per cwt.; 3 cwt. and under 10 cwt., 18s.; 10 cwt. and under 20 cwt., 17s.; 20 cwt. and upwards, 15s.

Fowler's Clip Pulley.—Makers, John Fowler and Co., Leeds; Prices on application.

Kelsey's Wedge, Driving Drum, and Pulley.—Particulars and prices of this may be obtained from Mr. William Kelsey, engineer, 118, Cannon-street, London.

Messrs. Ormerod, Grierson, and Co. St. George's Ironworks, Hulme, Manchester, are extensive manufacturers of every variety of winding apparatus, and will give prices of any portion in detail.

Messrs. Williams, Perrin Foundry Company, Cornwall. Messrs. Harvey and Co., Cornwall; Messrs. West and Sons, Cornwall.

TRANSMISSION OF MINERAL THROUGH THE SHAFT TO SURFACE.

The apparatus used for this purpose is the same in principle, however much it may vary in its practical application, according to the forces employed; whether we take the common windlass, the horse-whim, or the more powerful steam appliances, we find the variation to be one of degree only.

Windlasses.—These are used for drawing by hand-labour in sinking winzes, or shallow shafts, and are put up by the miners at trifling expense.

Horse Whims.—These have been extensively used in Cornwall, though at present they are superseded to a very great extent by steam winding. They are only used where drawing is shallow, and the shaft is not easily accessible to the whim-engine. Being so well known they need no description, and are made on the mines at a labour cost of from 4s. 6d. to 5s. per foot of the diameter of the drum.

Steam-winding Cages or Drums.—These are generally constructed similar to those already described for underground winding, though in cases where round wire-ropes are used conical drums have sometimes been advantageously substituted.

The **Pulleys** used at the top of the shaft, and through the intervening distance to the cage, are made of cast-iron with light wrought-iron arms, but often entirely cast-iron. In the colliery districts when the diameter of the wheel is about 10 ft. and upward, it is usually made with cast-iron rim and sockets, and light wrought-iron spokes. We noticed makers in our remarks on underground apparatus. Prices—Sheaves, with wrought-iron arms, light pattern, 21s. per cwt.; ditto, heavy pattern, 18s. per cwt.

Kibbles.—These are made of various sizes, depending on the force applied for drawing the material. The smallest sizes in use are called winze kibbles, and are used with the windlass; a larger size is used with the horse-whim, and a still larger with the steam-whim, and which carry from 10 cwt. to 15 cwt. of stuff. Kibbles are made of either rolled or hammered iron plates; and kibble-moulds are procurable from the foundries for shaping the plates, so that the kibbles may be made on the mines, or plates ready moulded can be had. Made by all founders in mining districts. Prices—Winze kibbles, 13s. 6d. each; whim kibbles, rolled iron, 26s. per cwt.; hammered iron, 27s.

Skips.—These to a very large extent have superseded kibbles in steam drawing in metalliferous mines. They are rectangular in shape, and made of stout plate-iron, open at the top, and the bottom sloped to empty itself through a trap-door. They slide between guide-rods extending the whole depth of the shaft. Two wheels are fitted on each side of the skip for lessening the friction, and on which it rolls when working on inclines. Made by all founders in mining districts. Prices—3s. per cwt.

Cages.—These must not be confounded with winding cages, previously mentioned. They are used in collieries for conveying men to and from their work, and wagons containing coals through the shaft or pit, and are adapted to carry usually from 1 to 4 tubs at a time; in some cases the tubs are placed side by side, while in others the cage consists of two floors or decks. They are generally constructed of light wrought-iron bars, but steel has been substituted with advantage, both for strength and lightness. They are fitted with suitable slide appliances for securing ease and freedom of motion over the guides through the shaft. The guides are either of wood or iron, and are generally fixed one on each side of the shaft. Where wood or angle-iron guides are used they are attached to cross-pieces in the shaft fixed at short distances, but in many instances a continuous bar of iron or wire rope is fixed at the bottom of the pit, and screwed up tight to the pulley-head. For the protection of the men in riding the cages are sometimes covered with sheet-iron. All founders in the colliery districts supply prices of cages.

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and of feet in diameter that the rope is inches in depth, so that the load from the sudden strain of the rope would require a 12-ft. drum. To prevent the sudden strain of the rope from injuring the wire-rope or connection of the springs for supporting the pulley over which the rope passes, the head of the shaft; the action of the instant strain is thereby relieved from the rope and connections to the pulley on the way which lowers to meet it, and gradually rises to its place to take the full weight of the load. The patent right of these springs held by Messrs. Newall and Co., of Gateshead-on-Tyne, have introduced

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lowers to meet it, and gradually rises to its place to take the

full weight of the load. The patent right of these springs held by

Messrs. Newall and Co., of Gateshead-on-Tyne, from whom full

particulars may be obtained. This firm manufacture all classes

of wire-ropes.

Messrs. E. H. Hawke and Co., Scorrer, Cornwall, are exten-

sive manufacturers of every variety of hemp and wire ropes, and the

very superior manufacture. We notice also amongst the

makers of every class of hemp and wire ropes—Messrs. John

Monkwearmouth; Messrs. William James Glover and Co., St. Helens;

makers of hemp and wire ropes, Messrs. Warrington, Warrington, Warrington, Flint; Messrs. John and Edwin Wa-

rrington, Garrison-street, Birmingham.

The prices given below are only intended to give an idea of

cost of ropes and chains, as they fluctuate so freely with the

price of raw material. Chain being made by all ironfounders, it is

quite unnecessary to mention any particular firms. Chain made

by Knight's or Bradley's extra refined iron, 11-16ths and 3/4 in. 34s. per

cwt.; 3 in. 37s. per cwt.; 9-16ths in. 38s. 6d. per cwt.; 3 in. 34s. per

cwt.; 3 in. 44s. per cwt. Hemp rope (round) about 40s. per

small flat, ditto, up to 4 in. diameter, about 46s. per cwt.; in

sizes, up to 9 in. diameter, about 44s. per cwt.; charcoal iron

(round) about 34s. to 38s. per cwt., according to size; flat

46s. to 48s. per cwt.; steel wire (round) from 60s. to 70s. per

according to size; steel wire (flat) from 70s. to 75s.

THE SOUTH MIDLAND ENGINEERS, AND ECONOMY

FUEL CONSUMPTION.

There was a monthly meeting at the South Midland Institute Engineers at their rooms, Wolverhampton, on Monday, when Edward Jones (president) was in the chair, and there were also present—Messrs. H. Beckett, T. Rose, E. Marten, W. Blaken, G. Glennie, J. Bromley, B. P. Walker, S. Watkin, W. Underwood, F. Githin, D. Bickley, T. G. Healey, Naylor, Thomas, and others.

The special business of the meeting was to be the discussion of a paper by Mr. E. B. Marten, C.E., of Stourbridge, on "Economy of Coal for Domestic Purposes."

The author assumed the necessity that cheerful open fire-places were necessary to the comfort of the Englishman, and his object was to show how

fire-places might be used for heating and ventilation with the

possible waste of coal.

The problem was to secure a somewhat greater

warm, fresh air into the room that was carried out by the chimney, and which carry from 10 cwt. to 15 cwt. of stuff.

Kibbles are made of either rolled or hammered iron plates; and kibble-moulds are procurable from the foundries for shaping the plates, so that the kibbles may be made on the mines, or plates ready moulded can be had.

Made by all founders in mining districts.

Kibbles.—These are made of various sizes, depending on the

force applied for drawing the material.

Skips.—These to a very large extent have superseded kibbles in

steam drawing in metalliferous mines. They are rectangular in

shape, and made of stout plate-iron, open at the top, and the bottom

sloped to empty itself through a trap-door. They slide between

guide-rods extending the whole depth of the shaft. Two wheels

are fitted on each side of the skip for lessening the friction, and on

which it rolls when working on inclines. Made by all founders in

mining districts. Prices—3s. per cwt.

Cages.—These must not be confounded with winding cages,

APRIL 5, 1873.]

carrying radial arms; here it is mixed with a weighed quantity of the sand cement, and exposed to the action of steam from a small boiler, the sand being kept revolving all the time. The mixing process (not occupying more than a few minutes) being completed it is removed a doughy mass, which is moulded into balls, and made into blocks by means of a mould. These balls, although soft when made, soon become hard, and are, in fact, capable of resisting a sensible blow, and are not acted on either by cold or hot water. This action of heat and heat is a very serious consideration in patent fuels. The Professor in his amusing story of a fuel that he was examining at Woolwich some years ago, said that he had determined to try it at the Royal Arsenal, it was stacked on the spot, but during the night there was a heavy storm of rain. Next day, on arriving at Woolwich the Professor was surprised to find his patent fuel gone, the rain having washed it out of all shape and make, and had brought it back to the state of a sort of coal, which had to be thrown into the Thames to be got rid of. The advantage of this fuel, which will, we think, command the notice of the owners, is that its density is greater than that of coal, and thus stowage room is saved. It has been well tried, and everywhere successfully, having been used on two engines on the North London line, also two powerful boiler engines at Woolwich Dockyard, and two river steamers; and it is at the present moment being employed on board two steamers trading with Stockholm, and in the course of the Polytechnic, where it can be seen in operation. Specimens of the same will be distributed amongst the audience, who throughout this meeting will be able to judge of the practicality of the fuel. The experiments produced by the Professor in illustration of his subject. The experiments produced by this institution we are glad to see is springing into great activity. The laboratory and chemical lectures have much improved under the direction of Professor Gardner.

MERCANTILE DIRECTORY.—The new edition of Street's "Indian and Colonial Mercantile Directory" has just been issued, and as the same has already obtained a high reputation both for completeness and accuracy amongst all engaged in commercial business with the dependencies of England, it will be scarcely necessary to say that the same amount of care in its correction appears to have been exercised as in previous years; alteration in addresses of our own subscribers in Canada and Australia having been duly made, and we have only received notice of change within the last few mails. The cost-book company was formed about nine months since, and divided into 10,000 parts or shares, for the purpose of working a rich vein of tin, which was discovered in a clay pit, known as the "Plymouth Lode," and which produced from assay 100 lbs. of tin to the ton of stuff, and is now producing as much as 112 lbs. per ton. The average quantity of tin to pay for working is about 10 lbs. to the ton. A steam-engine with 24 heads of stamps was purchased and dressing floors commenced to be laid out, when four other distinct lodes were discovered. No. 1 was found from 15 to 20 ft. wide, and producing 50 lbs. of tin to the ton of stuff; No. 2, about 8 ft. wide, producing 60 lbs. to the ton; No. 3, Plymouth lode, mentioned above; No. 4, about 4 ft. wide, 46 lbs. to the ton; No. 5, 5 ft. wide, producing over 100 lbs. to the ton.

Capt. Tregay, manager of Pen-an-drea United Mines, in his report says:—

"In taking samples I rejected the best stones, and took only what appeared of doubtful value. One of these produced 46 lbs. of black tin per ton of stone, another produced 56 lbs. per ton, and another 112 lbs. per ton of stone. I had this black tin reduced to metal, and it produced 14 in 29, equal to 70 per cent. of very fine metal, which is a very good product and considerably above the average of Cornish mines."

The directors, therefore, invite subscriptions for the remaining shares with great confidence, knowing that they will not have to do like most companies do, expend a large amount of capital in exploring. In Wheal Mary five lodes have been discovered, sunk on, and proved to be richer than the majority of dividend-paying tin mines. The engine is erected, the stamping and dressing floors nearly completed, and there are many thousands of tons of tin-stones at grass ready for the stamps, so that large profits must immediately follow the formation of this company.

By the sale of these unallotted shares now being offered to the public more than sufficient capital will be provided for the purchase and erection of extra machinery, which is now found necessary to render marketable the practicable inextinguishable supply of tin-stuff.

This company has been thoroughly inspected and reported on by the undermentioned practical miners, viz.:—Capt. Wm. Tregay, manager of Pen-an-drea Mines, Redruth; Capt. James Pope, of Redruth; Capt. R. H. Williams, C.E., manager of Charleston United Mines, St. Austell; Capt. Wm. Hancock, manager of Old Trebrett Mine, Wadebridge; Capt. S. Symons, manager of Castell-an-Dinas Mine, St. Columb; Capt. Geo. Stephens, manager of Belwoda Beacon Mine, St. Columb; all of whom concur as to the value of the property.

The directors are all thoroughly acquainted with the property, and Capt. Parkyn, to whom great credit is due for the discovery of the lodes, has consented to continue the management of the mine.

The directors invite the attention to the reports accompanying the prospectus, and an early application for shares. All shares will be allotted in the order of application.

The mine is very extensive, being nearly a mile square, and the lodes run through the entire sett, by which it can be calculated that immense profits are likely to follow the energetic development of the property.

Prospects containing detailed reports may be obtained at the offices of the company, 165, Strand, London.

WHEAL MARY TIN MINING COMPANY (LIMITED).

Registered under the Companies Acts, 1862 and 1867.

Capital £50,000, in 10,000 shares of £5 each,

All fully paid, and without further liability,

Of which only 2600 can now be offered to the public, the remainder having been privately subscribed for by 66 shareholders.

The shares will be allotted in the order of application, and all applications must be accompanied with the full amount of £5 per share, payable either to the South Cornwall Bank, St. Austell, Cornwall, or to the directors.

DIRECTORS.

HENRY FRANCIS WHITEFIELD, Esq., St. Columb, Cornwall.

Capt. THOMAS PARKYN, Roche, St. Austell, Cornwall.

WILLIAM JAMES THOMPSON, Esq., St. Germans Road, Catford Bridge, Kent.

BANKERS—SOUTH CORNWALL BANK, St. Austell, Cornwall.

SECRETARY—DAVID AMIS, Esq.

OFFICES—165, STRAND, LONDON.

PROSPECTUS.

This present limited liability company has been formed for the purpose of taking over with the object of more extensive development, the mineral property known as Wheal Mary Tin Mine, lately having been worked by a small cost-book company.

The cost-book company was formed about nine months since, and divided into 10,000 parts or shares, for the purpose of working a rich vein of tin, which was discovered in a clay pit, known as the "Plymouth Lode," and which produced from assay 100 lbs. of tin to the ton of stuff, and is now producing as much as 112 lbs. per ton.

A steam-engine with 24 heads of stamps was purchased and dressing floors commenced to be laid out, when four other distinct lodes were discovered. No. 1 was found from 15 to 20 ft. wide, and producing 50 lbs. of tin to the ton of stuff; No. 2, about 8 ft. wide, producing 60 lbs. to the ton; No. 3, Plymouth lode, mentioned above; No. 4, about 4 ft. wide, 46 lbs. to the ton; No. 5, 5 ft. wide, producing over 100 lbs. to the ton.

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The reports of Capt. R. Rowe, manager of the Great Laxey Mines, Capt. Edward Bawden, and Capt. M. Grose, with full prospectuses and forms of applications for shares, can be obtained at the company's offices.

my application, and I request you to allot me that amount, and I engage to pay the balance upon that or any less amount that you may allot to me, according to the terms of the prospectus.

Name _____

Address _____

Description _____

Date _____

If not convenient to make the deposit with the bankers of the company, this form may be sent by post to the secretary, with cross cheques made payable to him, in which case the bankers' receipt will be returned to the applicant.

THE COLBY MINING COMPANY (LIMITED), ISLE OF MAN.

Registered under the Companies Acts, 1862 and 1867.

Capital £30,000, in 15,000 shares of £2 each.

Payment on application £5s. per share, and on allotment 5s. Calls to be made at intervals of not less than three months.

DIRECTORS.

J. C. PARRY, Esq., Russell-road, Kensington, W. (Chairman of the Deer Park Mining Company, Limited).

W. CAMERON BATHE, Esq., Sussex-place, Regent's Park, N.W.; and Lloyd's, E.C.

C. A. STRONG, Esq., The Willies, Cuckfield, Sussex.

W. WILDE, Esq., Woodborer's Lodge, Abbey-road, N.W.

A. R. WORMALD, Esq., 26, Moorgate-street, E.C.

BANKERS—M. WILLIAMS, DEACON, and CO., 26, Birch-lane, E.C.

AUDITOR—JAMES FORD, Esq., 76, Cheapside, E.C.

SECRETARY—E. T. R. WILDE, Esq.

OFFICES—17, GRESHAM STREET, LONDON, E.C.

This company is formed to acquire and develop very valuable silver lead mining properties in the Isle of Man—locality well known for its ore-bearing walls, in evidence of which may be mentioned the large dividends paid and the premiums realised on the shares in the Foxdale and Great Laxey Mines, the present quotations being respectively £30 to £35 on £25 paid; £16 to £17 on £4 paid.

The property is known as the Colby and the Ballakindry Mines, and comprises together an area of about 397 acres, and a most important feature is the fact that several known lodes traverse it, which are intersected by counter lodes or cross-courses, at the junction of which there are invariably found large deposits of ore.

There is a good supply of water for pumping, washing, &c., and making marketable any quantity of ore, and a good shipping port is only 1½ mile distant.

The only agreement is dated 12th March, 1873, between E. T. R. Wilde, and A. R. Wormald.

The reports of Capt. R. Rowe, manager of the Great Laxey Mines, Capt. Edward Bawden, and Capt. M. Grose, with full prospectuses and forms of applications for shares, can be obtained at the company's offices.

GREAT TIN WORKS ASSOCIATION (LIMITED).

Registered under the Companies Acts, 1862 and 1867.

Capital £25,000, in 25,000 shares of £1 each.

Of which 10,000 shares are already allotted, leaving 15,000 shares to be applied for by the general public.

£0 2 6 to be paid on application.

0 7 6 on allotment.

0 5 0 three months after allotment.

0 5 0 six months after allotment.

£1 0 0 when all liability will cease.

The shares, when fully paid, will be exchanged for share warrants, to bearer, on payment of stamp duty. In the allotment of shares, applicants desiring to pay up their shares in full, subject to a discount of 5 per cent., will be preferentially considered.

DIRECTORS.

W. D. CHRISTIE, Esq., C.B., 32, Dorset-square, and Athenaeum Club.

CHARLES H. DASHWOOD, Esq., Athenaeum Club, Pall Mall, S.W.

Capt. T. ARCHIBALD DAVIS, Burton Crescent, Tavistock Square, W.C., Director of the British Guardian Assurance Company.

Capt. G. J. HAMILTON, Broxbourne, Herts; Chairman, West Esgair Le Mining Company (Limited).

(With power to add to their number.)

BANKERS.

LONDON AND COUNTY, Lombard-street, and its Branches.

SOLICITORS.

Messrs. GRIFFITH and BROWNLAW, 24, Bedford Row, W.C.

BROKER.

E. CAVENDISH TAHOURDIN, Esq., 13 and 14, Cornhill, E.C.; and 49, Piccadilly Circus, W.

SECRETARY—D. FORREST, Esq.

OFFICES—164, GRESHAM HOUSE, E.C.

PROSPECTUS.

This company has been formed for the purpose of purchasing and working, upon an extensive scale, a valuable tin-bearing property, situated in the parish of Germoe, in the county of Cornwall, held under lease for 21 years, at a dead rent of £30 per annum, merging into a royalty of 1-20th.

The sett is situated in the heart of the best tin-producing district in Cornwall, and is surrounded by many of the largest dividend-paying mines in the county. Through this sett run the lodes which have in Great Work Mine yielded such immense riches. Great Work Mine is now being worked in the direction of Great Tin Works, and with most profitable results, the value of the lodes steadily increasing as they are driven nearer to the latter mine, leading to the well-founded conjecture that the lodes in Great Tin Works will be found even more productive than its wealthy neighbour.

The geological position is that can be desired. The stratum is killas (clay-slate), and highly congenial for the production of mineral. The sett lies at the foot of Tregennan Granite Hill, so that it is immediately upon the junction of the killas with the granite. In this formation of ground the celebrated lodes of Great Work and Great Metal have proved so prolific, and are still producing such large quantities of tin; placing the district in the front rank as a great tin-producing centre.

In this sett several fine lodes have been proved. The main or champion lode enters the granite at the same angle as do the lodes of Great Work and Great Metal. This lode has been proved to a depth of 45 fathoms main drift, or about 50 fathoms from surface. From this lode alone, results of the greatest importance are confidently expected, as its value at the present shallow depth is greater than the average value of other highly productive tin lodes in the county. From the size of this lode immense quantities of tin can be raised. The side lodes can be opened upon at very slight cost.

The late owners have been working shallow on the back of some of the lodes near the shaft, and have made returns therefrom to a considerable amount. Their deepest point of operation was not more than 10 fathoms from surface. Want of adequate machinery has prevented them from prosecuting their operations in depth. Upon this and kindred points the report of Capt. Brown, the agent of the former owners of the sett, may be consulted with advantage.

To those practically acquainted with tin mining it is well-known that the richest deposits of ore are met with at the point of junction of the granite with the killas. This feature is one well recognised by miners; many of the best mines in Cornwall, thus situated, having returned enormous profits in comparison with the capital invested, as the following instances, taken from the Mining Papers, abundantly prove:

Mines.	Outlay.	Dividends.
Botallack	£21,250	£112,550
Carn Brea	31,000	280,500
Dolcoath	46,137	335,335
East Basset	18,941	67,512
Providence	11,518	137,107
St. Ives Consols	19,105	461,070
South Caradon	640	323,540
South Frances	9,293	155,833
Tincroft	51,000	135,300
Tresavean	4,080	449,644
West Basset	10,500	160,200
Wheal Buller	14,444	237,834
Wheal Bassett	2,624	323,500

Thus we see that on a capital invested of £230,635 dividends amounting to £3,207,940 have been paid. These represent only the profits of a very recent period. The Great Wheal Vor Mine, in the immediate vicinity of this sett, has yielded enormous profits when the was at about half its present value. The profits of Great Work must have been far beyond this amount, while the outlay was very small, the mine being rich almost up to the surface.

Those practically engaged in the mining aver that £70 per ton is a remunerative price for black tin. The present standard is about £55, and the market is steadily rising. There is every prospect of the standard touching £100 per ton within the next few months, as the statistics of the tin trade prove that stocks are very low; the demand increasing, while the supply is rapidly diminishing.

The directors introduce this property to the public with confidence. The small amount of purchase money—£12,500, of which the vendors have agreed to accept £10,000 in fully paid shares, compared with the working capital (£12,500), will contrast favourably with the enormous premiums which have of late been exacted for mining properties both at home and abroad.

This mine will be worked with the strictest economy, compatible with a vigorous development of its mineral resources, while, at the same time, the directors will take every care to avail themselves of modern improvements in machine appliances. Perusal of the annexed reports, by some of our best mining authorities (all intimately acquainted with the mineralogy of the district), should convince the most sceptical that the capital will be amply sufficient to place this property in a permanent dividend-paying condition.

This property has been secured under an agreement, dated March 6, 1873, between Edward Cavendish Tahourdin, as vendor on the one part, and William Bennett as purchaser on behalf of the company of the other part.

Copies of the Memorandum and Articles of Association lie for inspection at the offices of the solicitors of the company.

Application for shares, in the form accompanying the prospectus, with a deposit of 2s. 6d. per share, may be made to the bankers, broker, or secretary, from either of whom prospectuses may be obtained.

2000 SHARES ARE OFFERED FOR SUBSCRIPTION AT PAR IN
THE WHEAL BONNY TIN MINE AND SHELTON
CLAY WORKS COMPANY (LIMITED).

Capital £30,000, in 6000 Shares of £5 each.

Of which 1800 are allotted in part payment of purchase, which will, for the first three years only, be entitled to participate in dividends after payment of 10 per cent. per annum on the new capital subscribed.

£1 payable on deposit. £1 payable on allotment—the remainder, if required, at intervals of not less than three months between each call.

DIRECTORS.

NICHOLAS HEALD, Esq., Albert-square, Manchester.
JOSEPH RAMSDALE, Esq., Landsdowne-villas, Lee, Kent.
J. PEACOCK TURNER, Esq., 57, Gracechurch-street, London.
JOHN HARRIS, Esq. (Messrs. Luke & Co.), Charlestow, St. Austell.
SAMUEL MOSS, Esq. (Messrs. Moss and Co.), Par, Cornwall.
PHILIP GILES, Esq., St. Austell, Cornwall.

BANKERS.

LONDON AND COUNTY BANK, London, and Branches.

SOLICITOR.

ALEXANDER KERLY, Esq., 98, London Wall, B.C.

AUDITOR.

HENRY BROWN, Esq., Public Accountant, Victoria Chambers, Westminster.

SECRETARY.

FREDERICK WARWICK, Esq., Bucklersbury, London, and Swansea.

OFFICES, 25, BUCKLERSBURY, LONDON.

This company is formed to take over, and by more extensive workings, further develop the celebrated Wheal Bonny Mine, and also the extensive works adjoining, known as the Shelton China Clay Works.

The Wheal Bonny Tin Mine is situated in a Cornish district celebrated for tin, about three miles from St. Austell.

The sett is about 500 fathoms in length on course of the lodes, and about 400 fathoms in width across the lodes. There are four distinct lodes in the sett running parallel, besides veins and cross courses.

Extensive operations were commenced some years back; the proprietors, who now sell their interest to this company, have been working a portion of the sett only, and with a very small capital, at first only £5000, increased from time to time till it has reached a little over £8000, they have raised tin from two lodes only, which has realised the large sum of £20,842.

Bearing in mind that these returns have been obtained with no working capital, the amount subscribed having been entirely expended in plant, machinery, and permanent works, it cannot be doubted that further operations will prove equally successful; and when the other lodes are opened on it is anticipated that the returns will yield such profits as will pay good dividends to the investors.

The workings comprise three shafts, over which two large engines are erected; and are fitted to complete with pitwork and every necessary machinery.

The additional capital is required to sink these shafts deeper and to open out three other lodes. Little or no machinery will be required, the outlay being chiefly in labour. During the last four years the following sales of tin from two lodes only were made:—

From 1869 to 1872 inclusive, tin sold 233 tons 13 cwt. 0 qrs. 14 lbs., realising £20,308 19 10

Up to the 7th February in present year 533 7 10

Total £20,842 7 8

Out of which returns a dividend was paid in 1872. Such returns in four years only, notwithstanding that the property had to be opened and developed on a capital of little over £8000, speak for themselves.

The valuable clay sett adjoining is also a source from which large profits are anticipated; the delay in dressing (and also the limited demand) has hitherto retarded operations, but in spite of this a profit was made during last year's operations.

Additional appliances and every facility for raising now being completed, the returns can be regularly brought forward. The present selling price is now about 17s. per ton, whilst the cost of raising, dressing, dues, &c., does not exceed 9s., showing a profit of nearly 8s. per ton.

The clay is of good quality, the supply is inexhaustible, and the demand is very large.

The purchase money to be paid for the works, together with the leases of the tin and clay sets, buildings, plant, machinery, clay in stock, tin leavings, stores, &c., is £12,500, £3500 in cash, and £9000 in fully paid-up shares, upon which no dividend will be paid until three yearly dividends of 10 per cent. per annum have been paid on the new capital.

This company, therefore, offers to investors a most favourable opportunity, the following being some of the advantages which the undertaking presents:—

The purchase money is the actual value of the plant and property.

The possession of an extensive tin mine making monthly large returns; also extensive clay works in full operation.

The prospects that, with the experience of the past and by further development, still larger returns will be forthcoming, and that the company will continue to pay dividends.

The fact that the invested money will go at once to increase the permanent value of the property, and will not be expended in ordinary cost.

The property was inspected by C. Le Neve Foster, Esq., Royal School of Mines, in 1867, on whose report the vendors commenced operations, and subsequent facts have fully borne out his statements; also by Capt. Hancock.

The agreement for purchase made between Frederick Warwick, on behalf of the vendors, of the one part, and C. Carlyon-Simmons, Esq., and J. P. Turner, Esq., on behalf of the company, of the other part, and is dated 18th of March, 1873.

The leases, copies of Memorandum and Articles of Association, and plans of workings, can be seen at the solicitor's offices. An order to view the property will be sent on application.

Applications for shares, accompanied by a deposit of £1 per share, must be made to the London and County Bank, London, the bankers of the company, or to the secretary, at the offices, 25, Bucklersbury, London.

"IN UNION THERE IS STRENGTH."

THE INVESTORS' PROTECTION ASSOCIATION (LIMITED).

Incorporated pursuant to Act of Parliament.

Capital £5000, in Shares of £1 each.

To be fully paid up on Allotment, of which 250 shares only are now offered for public subscription.

APPLICATION CAN BE MADE FOR ONE OR MORE SHARES.

Among the first to support the Association the following may be named as having subscribed for shares, viz.:—

The Right Honourable Lord GRAVES.

Sir CHARLES HARVEY, Bart.

Sir GEORGE INNES, Bart.

The Honourable OLIVER GEORGE LAMBART.

Lieutenant-General DOWNING, formerly Political Superintendent of Serohi, Rajputanah.

J. H. PETER, Esq., M.A., J.P., formerly High Sheriff of the County of Cornwall.

Lieutenant-Colonel WILLIAM S. FERRIS (late Deputy Military Auditor-General and Controller, Military Finance Department, Bengal Army), Director of the East Suffolk Tramways Company (Limited).

G. WELLS OWEN, Esq., C.E. (late Public Works Department, Punjab), Chairman of the Sikkim-Fall Colliery Company (Limited).

Lieutenant-Colonel THOMAS BYTHESEA MORTIMER, Director of the London and Terai Tea Company (Limited).

J. CATO DANIEL, Esq., Director of the Mold Argoed Colliery Company (Limited).

Captain WILLIAM STEPHEN M. RAYNER, Director of the London and Terai Tea Company (Limited).

EDWARD ADOLPHUS SEYMOUR MIGNON, Esq., East India Merchant, Director of Peter Dixon and Sons (Limited).

THOMAS SPENCER, Esq., Merchant.

HUNTER STEPHENSON, Esq., East India Merchant.

HECTOR STEWART VANDOEUR, Esq.

JAMES GARDNER SAGER, Esq.

JOSIAH BUSHILL, Esq.

CHARLES BOWERBANK CAMPBELL, Esq.

BANKERS—THE IMPERIAL BANK, Lombury, London, B.C.

REGISTERED OFFICE, 39, LOMBARD STREET, LONDON, E.C.

THE INVESTORS' PROTECTION ASSOCIATION is established to protect the rights and interests of shareholders, debenture holders, and others interested in public companies.

To act as a faithful counsellor, and to afford the most reliable information on all matters relating to public companies and securities.

To do all things requisite for securing compliance with the provisions of the Companies Acts, in respect to the registration of returns, &c., &c.

To admit subscribers to the advantages of the Association upon such terms and conditions as may from time to time be determined.

To establish and regulate in the United Kingdom and elsewhere agencies for any of the purposes of the Association.

To do all such other things as are incidental or conducive to the attainment of the above objects.

Prospectus sent on application.

IMPORTANT TO INVESTORS.

Before investing your money, consult the Investors' Protection Association (Limited), instead of reading plausible advertisements and puff prospectuses. The Association will use its best endeavours to prevent investors from being drawn into bubble companies, thereby saving them from loss and, perhaps, from utter ruin.

Subscribers admitted on payment of an entrance fee of One Shilling.

Forms for Subscribers forwarded on application.

REGISTERED OFFICE, 39, LOMBARD STREET, LONDON, E.C.

SHAREHOLDERS, DEBENTURE-HOLDERS, AND OTHERS, interested in Public Companies, are invited to JOIN THE INVESTORS' PROTECTION ASSOCIATION (Limited), 39, LOMBARD STREET, LONDON, E.C. Entrance fee, One Shilling.

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HIBBERT'S PATENT ANTISEPTIC MEDICINE and LOTION obtained through any chemists, or Mr. HIBBERT, Manchester.

ISSUE of 6000 SHARES of £10 each, constituting the capital of the company, upon which a minimum dividend of 10 per cent. per annum, payable quarterly, is guaranteed for three years, during the further development of the properties, by the investment of the full amount (£18,000 sterling) in £19,407 Consols, now standing in the names of the undermentioned trustees, and all the net profits beyond the 10 per cent. will be divisible amongst the shareholders annually.

COPY OF TRUSTEES' CERTIFICATE.

We hereby certify that £19,407 Consols are now standing in our names as trustees to secure the due payment from the 1st April, 1873, to the 31st March, 1876, of a minimum dividend at the rate of £10 per cent. per annum, payable quarterly to the holders of shares in the Bettws Llanwit Colliery (Limited).

Dated the 27th day of March, 1873.

(Signed) CLARENCE EDWARD PAGET.

WILFORD BRETT.

JOHN ELIN.

THE BETTWS LANWIT COLLIERY (LIMITED).

Capital £60,000, in 6000 shares of £10 each.

Payable—£1 on application; £2 on allotment; £2 10s. on 1st July, 1873; £2 10s. on 1st November, 1873; with the privilege of paying up in full on allotment, and receiving thereon 10 per cent. dividend.

TRUSTEES.

Admiral the Right Hon. LORD CLARENCE PAGET, P.C., K.C.B.

Sir WILFORD BRETT, K.C.M.G.

JOHN ELIN, Esq., Director Alliance Bank (Limited).

DIRECTORS.

Sir WILFORD BRETT, Director Chelsea Waterworks Company—

CHAIRMAN.

WILLIAM BOYLE, Esq., Colliery Proprietor, Bridgend.

F. J. HESELTINE, Esq., Director of the Dunraven-Adare Coal and Iron Company (Limited).

H. A. REVELL, Esq., Junior United Service Club.

G. F. CARLYON-SIMMONS, Esq., Director Gnoll Colliery Company (Limited).

BANKERS—THE ALLIANCE BANK (Limited), Bartholomew-lane, E.C.

SECRETARY—E. W. LAYTON, Esq.

OFFICES—4, LOMBURY, B.C.

The directors are prepared to receive applications for the 6000 shares constituting the capital of this company, in respect of which a guarantee is given by a present deposit of the full amount in the hands of the above-mentioned Trustees of Government Stock for the punctual payment of a minimum dividend of 10 per cent. per annum for three years from the date of allotment, during which time the proposed extension works will be completed, and the full results thereof attained.

The guaranteed dividends will be paid quarterly at the company's bankers—on the 1st July, on the 1st of October, on the 1st of January, on the 1st of April; and the surplus profits will be divided annually.

This company has been formed for the purpose of acquiring, developing, and working extensive and valuable coal properties, now in active operation, situated about 5 miles north of the town of Bridgend, close to Port Cawl, and within a short distance from Cardiff, Swansea, and all the shipping ports on the Bristol Channel. Two branches of the South Wales Railway run through the property east and west, placing the colliery within easy reach of these shipping ports, also with the markets of the Midland Counties.

The coal is a first-class red ash house and steam coal, valuable for its gas-producing qualities, and for manufacturing purposes generally.

The price of coal being exceptionally high at the present time, it is more prudent to estimate the profits at the minimum rate of (say) 3s. per ton. This, as will be seen by the table in the prospectus, will give an annual income equal to 32 per cent. on the total capital of the company.

The present selling price of the large coal at the sidings is 20s. per ton, which gives a profit to the colliery of from 12s. to 13s. a ton; therefore the above minimum profit of 3s. per ton is a very moderate one, particularly as the coal is considered to be the best in the district.

The property is transferred for £45,000, of which the vendor has consented, at the option of the company, to accept one-third in shares.

The vendor will bear and discharge all the expenses of and incident to the establishment of the company up to allotment.

The reports of Messrs. Shelford and Robinson, of Mr. Latham, Mr. Birbeck, of Trelawny, and others, can be seen, together with the Memorandum and Articles of Association, and the contract of purchase, at the company's offices, where full prospectuses can be obtained.

THE GLENARIFF IRON ORE AND HARBOUR COMPANY (LIMITED).

Incorporated under the Companies Acts, 1862 and 1867.

Capital £130,000, in 13,000 shares of £10 each.

£1 to be paid on application, £1 on allotment, and the remainder by calls of £1 each, at intervals of not less than one month, of which the vendors are entitled to 6000, and 4000 will be taken by the directors and their friends, leaving 3000 now offered for subscription.

DIRECTORS.

GEORGE BATTERS, Esq., 2, Austinfriars, E.C.

THOMAS STIRLING BEGBIE, Esq., 36, Walbrook, E.C.

J. V. H. IRWIN, Esq., 2, St. Mildred's-court, Poultry, E.C.

J. M. McCANDLISH, Esq., 9, Victoria-chambers, Westminster, S.W.

BANKERS—Messrs. BARNETTS, HOARES, HANBURY'S, and LLOYD'S, 62, Lombard-street, E.C.

SOLICITORS—Messrs. THOMAS and HOLLAMBS, Mincing-lane.

AUDITORS—Messrs. JAMES and F. FORD, Public Accountants, 76, Cheapside, E.C.

SECRETARY—Mr. JOHN HAM.

ABRIDGED PROSPECTUS.

This company is formed for the purpose of acquiring two leases granted by the Earl of Antrim, of the iron ore, on the lands of Glenariff and Cloughore, in the county of Antrim, and for the purpose of constructing a railway and harbour in connection therewith, and for working and shipping ore.

The royalties have been carefully examined by Mr. Bauermaier, F.G.S., and Mr. Stephen Scott, manager of the Consall Hall Mines, Churnet Valley, and their reports can be seen, and copies obtained with full prospectus, on application at the offices of the company.

The royalties comprised in the leases extend over about 6675 acres (of which 5200 acres are estimated by Mr. Bauermaier to contain ore) and the leases are for 31 years, from 1st May, 1872, at a dead rent of £3500 per annum, merging into a royalty of 1s. per ton of ore raised and shipped. This dead rent does not commence until the 25th March, 1874.

The ore is the pisolithic hematite, or red and black nodular ore, and, from its richness and purity, is likely to command at all times a highly remunerative price.

</

ROCK DRILLING MACHINERY.



CHARLES BALL AND CO., lately Sole Agents for
THE BURLEIGH ROCK DRILL,

ARE NOW PREPARED TO SUPPLY THEIR NEW
ROCK-BORING MACHINE, OR "POWER JUMPER,"

Which they consider far superior to any other Rock-boring Machinery existing, and which they have, therefore, undertaken to bring before the public. The Firm's principle

"INVENTORS OF NONE—AGENTS FOR THE BEST"

Secures to its customers the best known machinery, as the Firm is entirely impartial in its adoption of any particular style of machine.

THE "POWER JUMPER"

Is recommended to the public on account of its qualities, which are the following. It is—

CHEAPER,
SIMPLER,
LIGHTER,
SHORTER,
THAN ANY OTHER.
COMPARISON INVITED.

Secondhand
BURLEIGH DRILLS
FOR SALE.

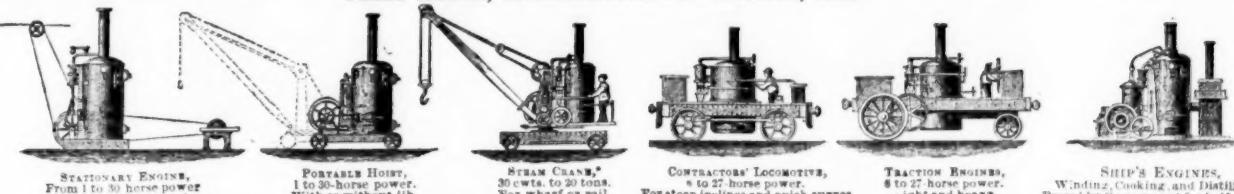
Brydon, Davidson, and Warrington's
Patent.

References, particulars,
Estimates, &c.,
Sent on application.

CHARLES BALL AND CO., Mining Machinery Makers, 21, NEW BRIDGE STREET, LONDON, E.C.

CHAPLIN'S PATENT PORTABLE STEAM ENGINES AND BOILERS.

PRIZE MEDAL, INTERNATIONAL EXHIBITION, 1862.



STATIONARY ENGINE,
From 1 to 30 horse power
No building required.

PORTABLE HOIST,
1 to 30-horse power.
With or without jib.

STEAM CRANE,
20 cwt. to 20 tons.
For wharf or rail.

CONTRACTOR'S LOCOMOTIVE,
1 to 27 horse power.
For steep inclines and quick curves.

TRACTION ENGINES,
8 to 27 horse power.
Light and heavy.

SHIP'S ENGINES,
Winding, Cooking, and Distilling.
Passed by Government for half water.

* These cranes were selected by H.M. Commissioners to receive and send away the heavy machinery in the International Exhibition.
From the STRENGTH, SIMPLICITY, and COMPACTNESS of these ENGINES they are extensively USED for GENERAL PURPOSES, and also in situations where STEAM-ENGINES OF THE ORDINARY CONSTRUCTION CANNOT BE APPLIED.

ALEXANDER CHAPLIN AND CO.,
PATENTEES AND SOLE MANUFACTURERS,

CRANSTON HILL ENGINE WORKS, GLASGOW.

ENGINES OF EACH CLASS KEPT IN STOCK for SALE or HIRE, and ALL OUR MANUFACTURES GUARANTEED as to EFFICIENCY, MATERIAL, and WORKMANSHIP.
Parties are cautioned against using or purchasing imitations or infringements of these patent manufacturers.

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OSWALD BROOKE AND CO.,
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PATENTEES AND SOLE MANUFACTURERS

OF
GOVERNMENT

FIREPROOF

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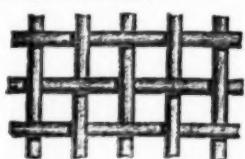
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AIR TUBING.

WORKS: COLLYHURST.

PROTECTION FROM FIRE!
TRADE MARK
SECURITY
Bryant & May's
PATENT SAFETY
MATCHES
LIGHT ONLY ON THE BOX!

STRONG WIREWORK.



STRONG WIREWORK, the cross wires equally bent; also BEST STAMP GRATES, both of iron and copper, and punched copper plates. DITTO TUBED. All the above promptly supplied at

W. ESCOTT'S MINING MATERIAL DEPOT,
TAVISTOCK, DEVON.

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GUIDE TO HEALTH; or, ADVICE AND INSTRUCTIONS FOR THE CURE OF NERVOUS DEBILITY.—A New Medical Work on the Treatment of Local Debility, Consumption, Loss of Memory, Physical Depression, Indigestion, and all diseases resulting from loss of nerve power. Illustrated with cases and testimonials. Sent free for two stamps.—Dr. SMITH will, for the benefit of country patients, on receiving a description of their case, send a confidential letter of advice.—Address, Dr. H. SMITH, 6, Burton-crescent, London, W.C.

BY HER MAJESTY'S



ROYAL LETTERS PATENT

STANLEY'S PATENT FURNACE

FOR SMELTING ORE OR RE-MELTING IRON OR OTHER METAL,

PUDDLING AND ALL KINDS OF HEATING FURNACES.

JOHN MARTIN STANLEY, PATENTEE & SOLE LICENSOR
SHEFFIELD.

The advantages of these furnaces are, in the first place, they effect a saving of from 25 to 50 per cent. in fuel.
2ndly, The use and expense of grate-bars are dispensed with, as these furnaces have closed fire-places, formed in brickwork.
3rdly, They make from 80 to 90 per cent. less ashes than open fire-grate furnaces.
4thly, They have a purer flame, the combustion is more complete, and contains less free or unmixed air or gases.
5thly, The workmen have much less labour in working these furnaces.
6thly, They heat quicker, and are more under the control of the furnace-men.
7thly, They are not affected by the position of the wind or draughts.
8thly, The mills and workshops are cooler and more comfortable than where the open fire-grate furnaces are used.

For prices, and other information, apply to J. M. STANLEY, 27, Change-alley, Sheffield.

BOLTS AND NUTS. BOLTS AND NUTS

MADE BY PATENT MACHINERY.

Suitable for Engineers, Millwrights, Coach and Wagon Builders, Colliery, and other Purposes.

AN EXTENSIVE ASSORTMENT OF OVER 200 TONS ALWAYS IN STOCK.

From which orders can be promptly executed. Every description of Bolts and Nuts made to order.

BAR IRON. BAR IRON

OVER 1000 TONS OF BARS, PLATES, SHEETS, ANGLES, HOOPS, SQUARES, ROUNDS, AND FLATS.

All of First-class Quality.

RAILWAY, COLLIERY, AND TRAM RAILS, TO ANY SECTION

A large Stock of Anvils, Vices, Tongs, Irons, Smiths' Bellows, Files, Rasps, Picks, Spades and Shovels, Sledge and Hand Hammers.

Best Swedish Horse Nails, Back Bands, Plough Traces, Best Spring, Cast, Double Shear, and Blister Steel.

JOHN STANSFIELD (late Stansfeld and Sons), Iron Merchants, Bolt and Nut Manufacturers,

ALFRED STREET BOAR LANE LEEDS

CHAS. PRICE AND CO.'S RANGOON ENGINE OIL

AS SUPPLIED TO H.M. DOCKYARDS AND FLEET.

THIS OIL is suitable to every kind of Machinery. As a lubricant it is equal to the best Sperm and Lard Oil, while it possesses the great advantage of being entirely free from any principle which would corrode the metal bearings.

For particular kinds of Machinery, the Oil may be specially prepared of a consistency and character adapted to the nature of the work to be done.

"Chemical Laboratory, 7, Printing House-square, Blackfriars, April, 1862.
I herewith certify that the Rangoon Engine Oil, manufactured by Messrs. Chas. Price and Co., is free from any material which can produce corrosion of the metal work of machinery. It is intended to protect metallic surfaces from oxidation.

"The lubricating power of this oil is equal to Sperm or Lard Oil.

"T. W. KEATES, F.C.S., to

Every parcel of the Oil sent from the work bears the Trade Mark of the Firm.

LONDON: CASTLE BAYNARD, UPPER THAMES STREET.

WORKS: MILLWALL, POPLAR; and ERITH, KENT



THE "BURLEIGH" ROCK-DRILLING MACHINERY.

THOMAS BROWN, PATENTEE AND SOLE PROPRIETOR.



This celebrated ROCK DRILL, which by reason of its inherent merits has superseded all other Rock Drills, is now in extensive use in America, England, Scotland, and the Continent, and is indispensable in the economic working of all Railway Cuttings, Shafts, Quarries, and Mines.

Its prominent features are:—

I.—ITS SIMPLICITY.

Any labourer can work it, and it does not get out of order. It may be worked either by air or steam power, at will, without any alteration of the mechanism.

II.—ITS DURABILITY.

No part of the mechanism is exposed; it is all enclosed within the cylinder—so there is no risk of its being broken.

III.—ITS CAPABILITY.

In hard rock, like granite, gneiss, ironstone, quartz, the Tunnel Drill will progress at the incredible rate of 6 inches to 12 inches per minute. These machines can bore holes from 1 inch up to 5 inches in diameter, and, on an average, will go through 120 feet of rock per day—making 40 holes each from 2 to 3 feet deep. The drill can be used at any angle, and in any direction, and will clear itself to any depth up to 20 feet.

IV.—ITS ECONOMY.

As compared with hand labour the saving in actual drilling is very considerable, from the fact of the "out put" being increased 100%. The saving in the general expenses, and in the interest of capital, will be in a like ratio.

DRILL POINTS.

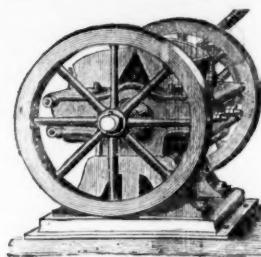
The saving in steel alone is incredible, ONE DRILL POINT WILL GO THROUGH TWENTY FEET OF ABERDEEN GRANITE WITHOUT SHARPENING. This fact will be duly appreciated by practical men.

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Machine No. 1—The Direct Double-Action.

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PATENT STONE BREAKING, QUARTZ CRUSHING, AND GRINDING MACHINERY.

Messrs. T. BROWN and Co., ENGINEERS, have much pleasure in calling attention to their IMPROVED MACHINERY for STONE BREAKING and QUARTZ CRUSHING, for crushing, grinding, or triturating Stone, Flint, Minerals, Ores, Chemicals, and other substances; for washing and separating Metals from Ores, and for extracting Gold from Quartz.

The principle of this invention is applied to machines of various construction, which contain within the range of their capability the power of reducing all hard materials to cubes of from $2\frac{1}{2}$ inches to impalpable powder. The mechanical construction of each description of machine is specially adapted for its own peculiar work, and experience has shown that each is eminently suited for the work for which it is designed.

They can be driven by water, steam, or horse power; they are light and portable, and their crushing and grinding surfaces are so constructed that when worn they can easily be replaced.

If intending purchasers would send a sample of the materials required to be crushed or broken it could be operated upon in their presence, and thus they would be guided in the selection of the machine best suited for their requirements.

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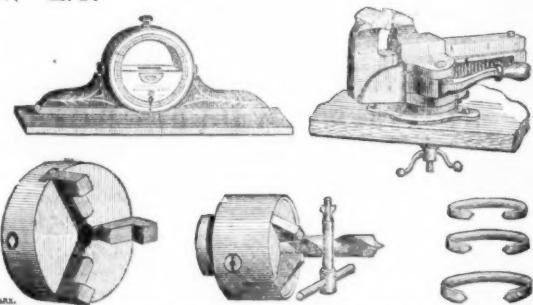
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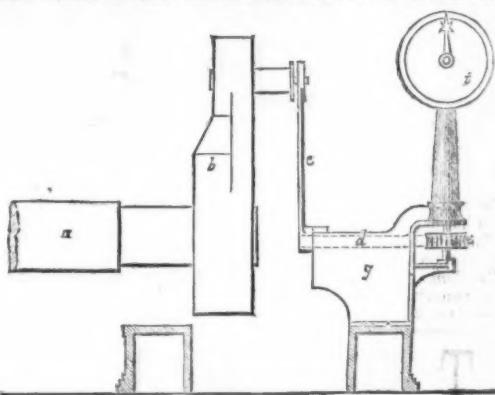
PEPPER MILL BRASS FOUNDRY COMPANY, DARLINGTON STREET, WIGAN, COLLIERY FURNISHERS, BRASS FOUNDERS, COPPERSMITHS, & GAS METER MANUFACTURERS,

The PEPPER MILL BRASS FOUNDRY COMPANY beg respectfully to invite attention to their IMPROVED SELF-REGISTERING COLLIERY WINDING INDICATOR, which, in addition to its ordinary use of indicating the position of the load in the shaft, registers the number of windings, thus enabling the manager at a glance, and at any moment, to check the return of the banksman or tallyman, by reading off from the dial the number of windings for any stated time.

This Indicator is especially adapted for Water Winding or Pumping. Its indications cannot possibly be tampered with, and unerringly show the number of windings or strokes for any stated period, so that it will at once be seen whether or not the person in charge has been fully discharging his duty.

These Winding Indicators are supplied either with or without the Self-registration Dial.

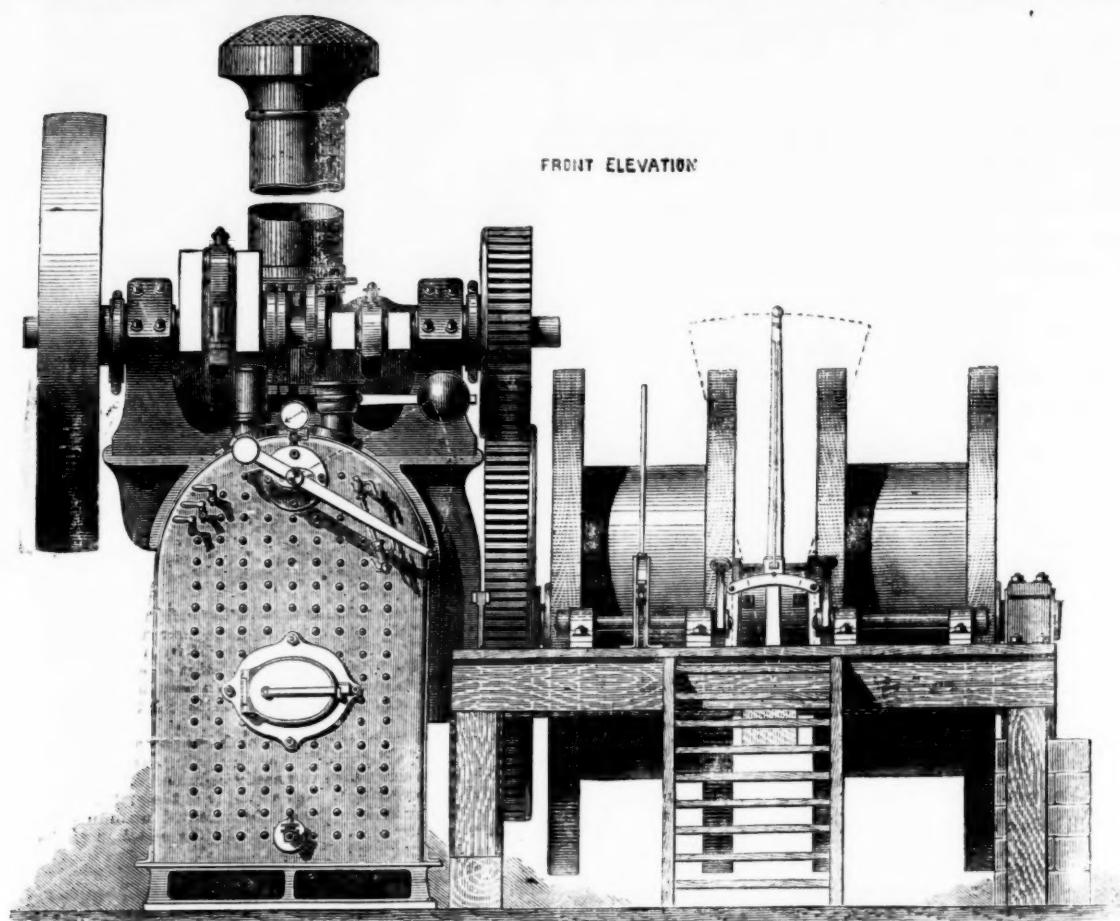
The Pepper Mill Brass Foundry Company will be glad to furnish, on application, sets of drawings illustrative of the simplest and cheapest mode of attaching their indicators to engines of various constructions, either vertical or horizontal.



One mode of attaching Indicator to horizontal engine.

These Indicators have been supplied to most of the principal Collieries in Lancashire, including Wigan Coal and Iron Co. (Limited); Ince Hall Coal and Canal Co. (Limited); Messrs. Jonathan Blundell and Son; John Grant Morris, Esq.; Messrs. Pearson and Knowles; Messrs. Andrew Knowles and Sons; Cheadle and Rugeley; Mostyn Coal and Iron Co.; Messrs. Pilkington Bros., St. Helens.

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FRONT ELEVATION

FROM 20 TO 200 EFFECTIVE HORSE-POWER.

FOR FULL PARTICULARS AND PRICES, APPLY TO—

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HAULING AND WINDING ENGINE

WITH
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 Haulage along inclined drifts is easily and cheaply effected;
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 Prices and full particulars on application as above, and also references to view the engine in successful work near Derby, Carnarvon, Haverfordwest, Darlington, Durham, Penzance, and other places.

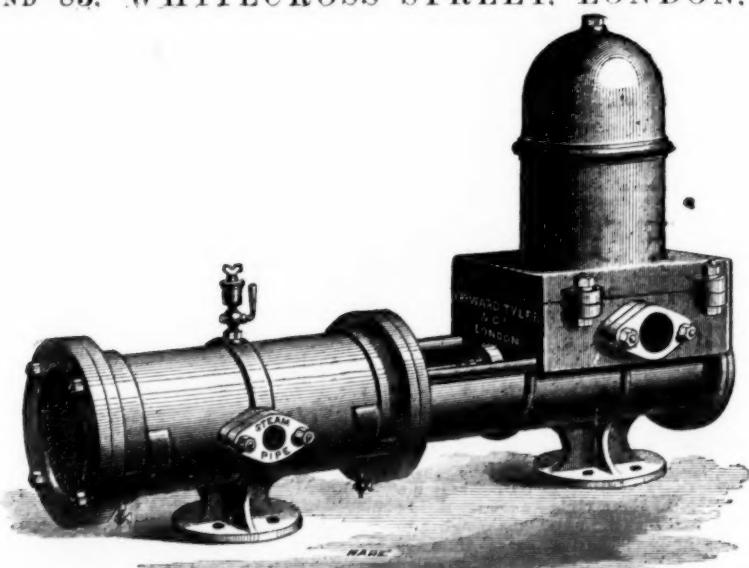
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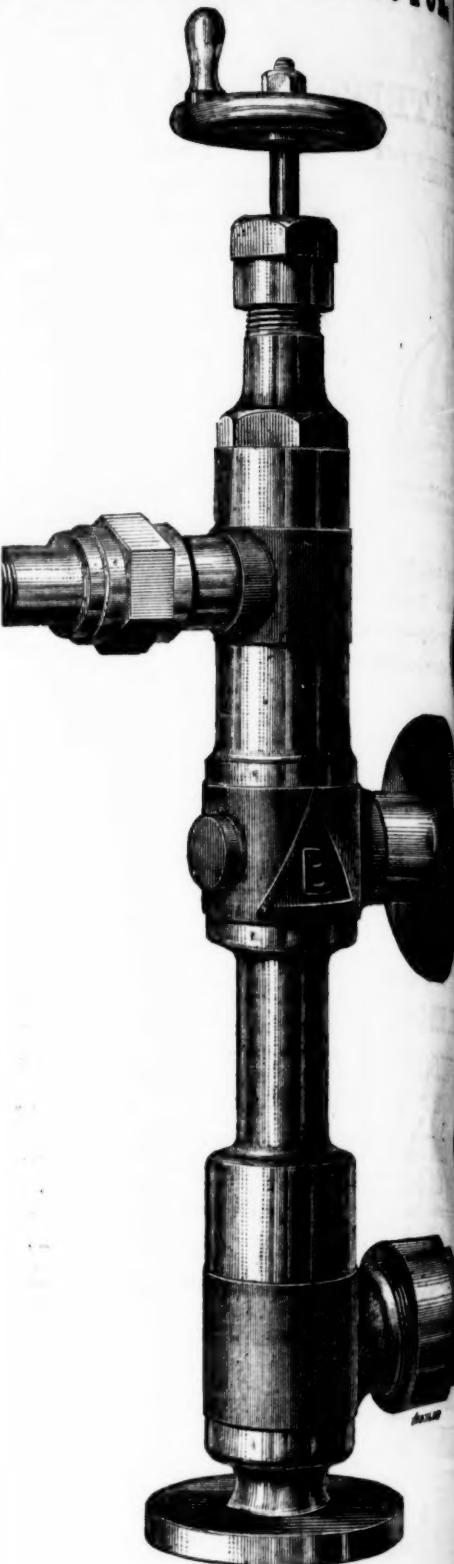
The Times, Dec. 10, 1869, speaks of them as "possessing many extraordinary advantages."

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